Rapid Methods for Assessing Wetland Condition

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What do we know about the health or *quality* of the nation's wetlands?

- "EPA can draw only limited conclusions about water quality in wetlands because the states used different methodologies to survey only 4% of the total wetlands in the nation"

- "Currently states and tribes have insufficient data to evaluate the health of wetlands or quantify the extent of pollutants degrading wetlands"

-National Water Quality Inventory Report to Congress (2000)

Why Wetland Monitoring?

Information is needed to measure the success of wetland programs and integrate wetlands into watershed planning

Why now?

Have the tools to do wetland monitoring and assessment at multiple scales

3-Tiered Approach

	Products/Applications
Level 1 - Landscape Assessment: Evaluate general condition of study area using readily available digital data.	•Status and Trends •Sample frame for site-level assessments
Level 2 – Rapid Assessment: Evaluate the general condition of individual wetlands using relatively simple indicators. Takes two people no more than a half day to do.	•401/404 permit decisions •Identify impacts and stressors •Regional or watershed assessments
Level 3 – Intensive Assessment Provide comprehensive data on individual wetlands. Takes four to six people a full day in the field.	•Evaluate and refine the rapid and landscape assessments •Provide diagnostic capability •Establish relationship with rapid assessment to extrapolate Level 3 information

Fennessy, M.S., A.D. Jacobs, and M.E. Kentula. 2004. Review of Rapid Methods for Assessing Wetland Condition. EPA600/R-04/009. U.S. Environmental Protection Agency, Washington, D.C.

Criteria for Judging Methods

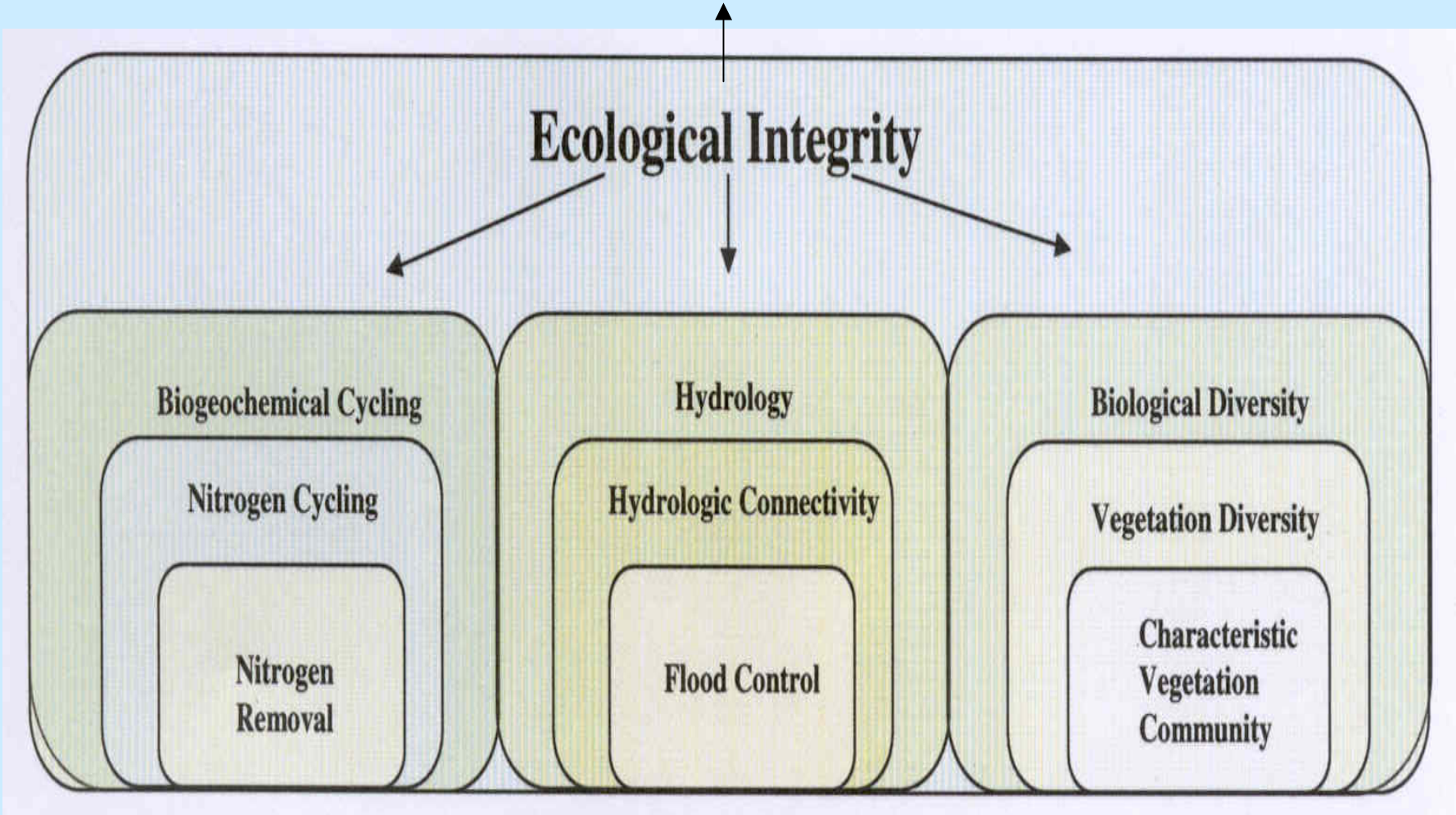
- *Measures condition*
- *Is rapid*
- *Uses site-level data*
- *Can be verified*

Condition is a measure of the ecological integrity of the resource.

"Wetlands perform a wide variety of functions in a hierarchy from simple to complex.

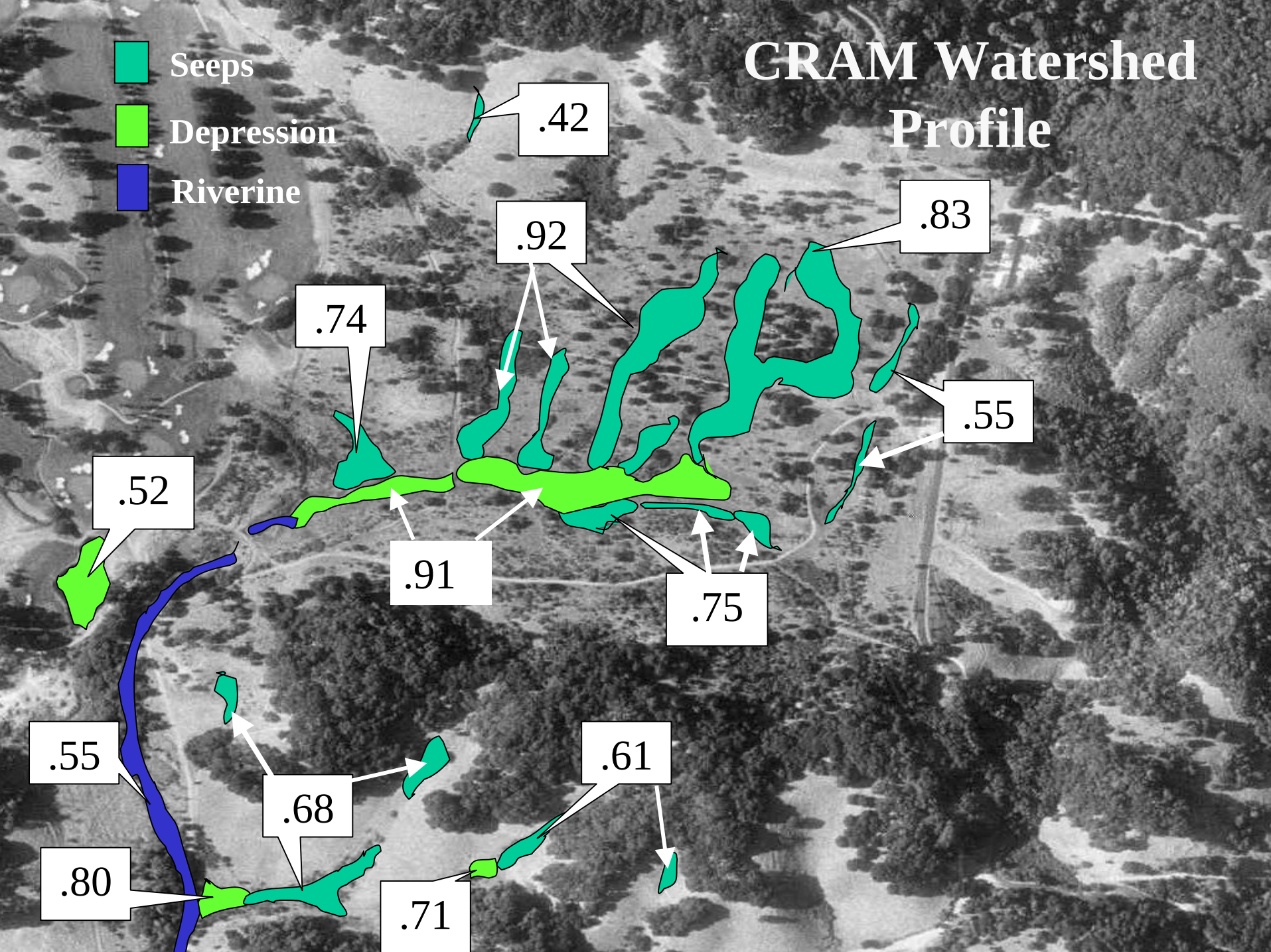
At the highest level of this hierarchy is the maintenance of ecological integrity, the function that encompasses all of the structural components and processes in a wetland ecosystem." *Smith et al. 1995*

Condition



Adapted from Fennessy et al. 2004 and Smith et al. 1995

Site	ST-Stor	LT-Stor	Dis-Energy	Cycle Nutr	Exp OM	Mtn Plts	Mtn. Anim
1	MED	MED	HIGH	HIGH	LOW	MED	MED
2	HIGH	MED	MED	HIGH	LOW	MED	MED
3	MED	MED	MED	LOW	LOW	MED	MED
4	HIGH	HIGH	MED	HIGH	MED	MED	LOW
5	HIGH	MED	LOW	MED	HIGH	LOW	LOW
6	HIGH	MED	HIGH	MED	MED	MED	MED
7	MED	MED	MED	HIGH	MED	MED	MED
8	MED	MED	HIGH	LOW	MED	LOW	LOW
9	MED	MED	MED	MED	MED	LOW	LOW
10	LOW	MED	MED	HIGH	MED	MED	MED


Seeps
Depression
Riverine
CRAM Watershed Profile
.42
.92
.83
.74
.55
.52
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.75
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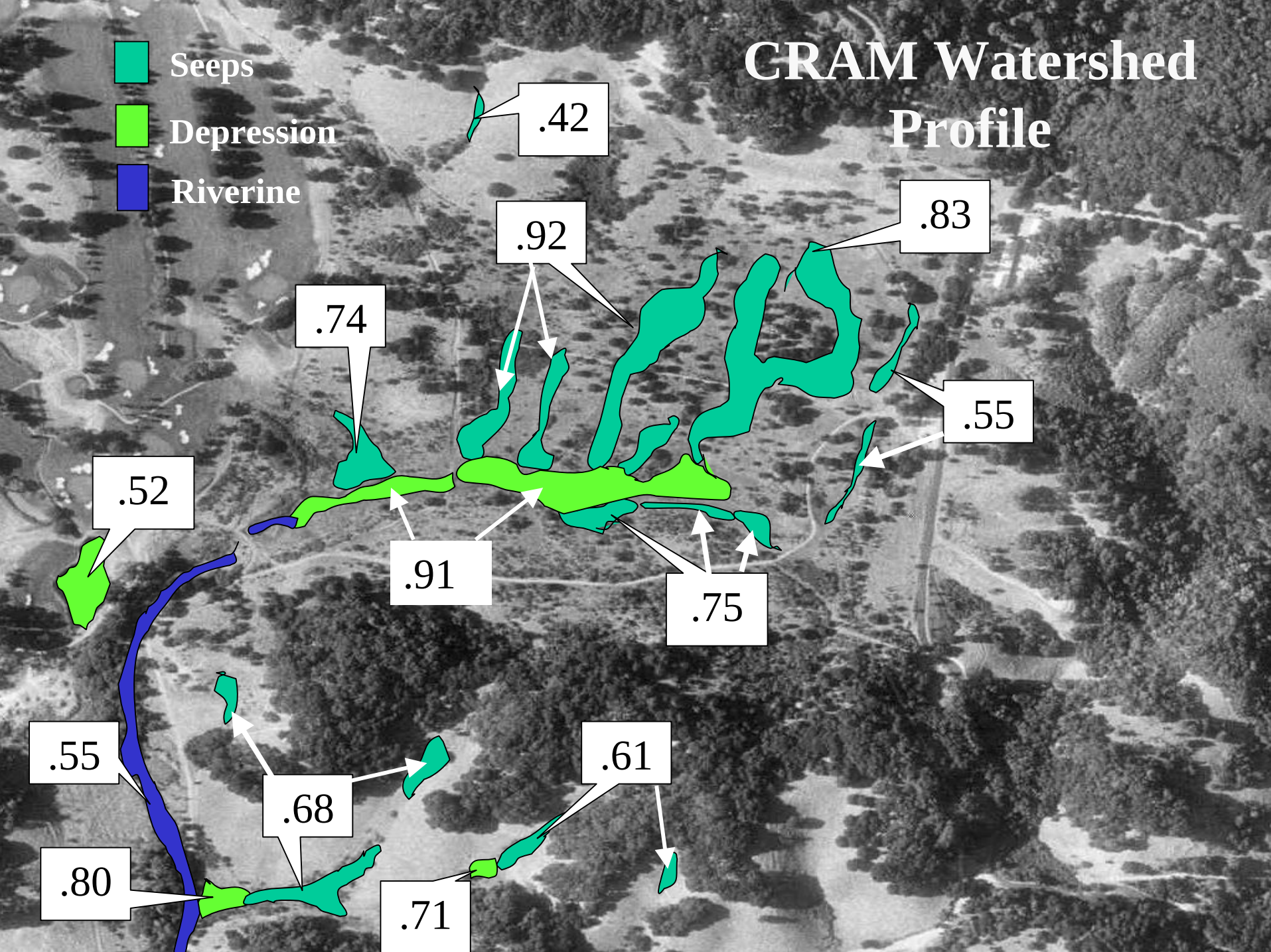
.68
.61
.80
.71

"While some wetland functions (e.g., habitat) may be defined at the scale of individual wetlands, most functions and values (e.g., biodiversity, water-quality improvement, flow moderation) depend on the type, abundance, and distribution of wetlands across a watershed or landscape."
Detenbeck et al. 1999 and references cited therein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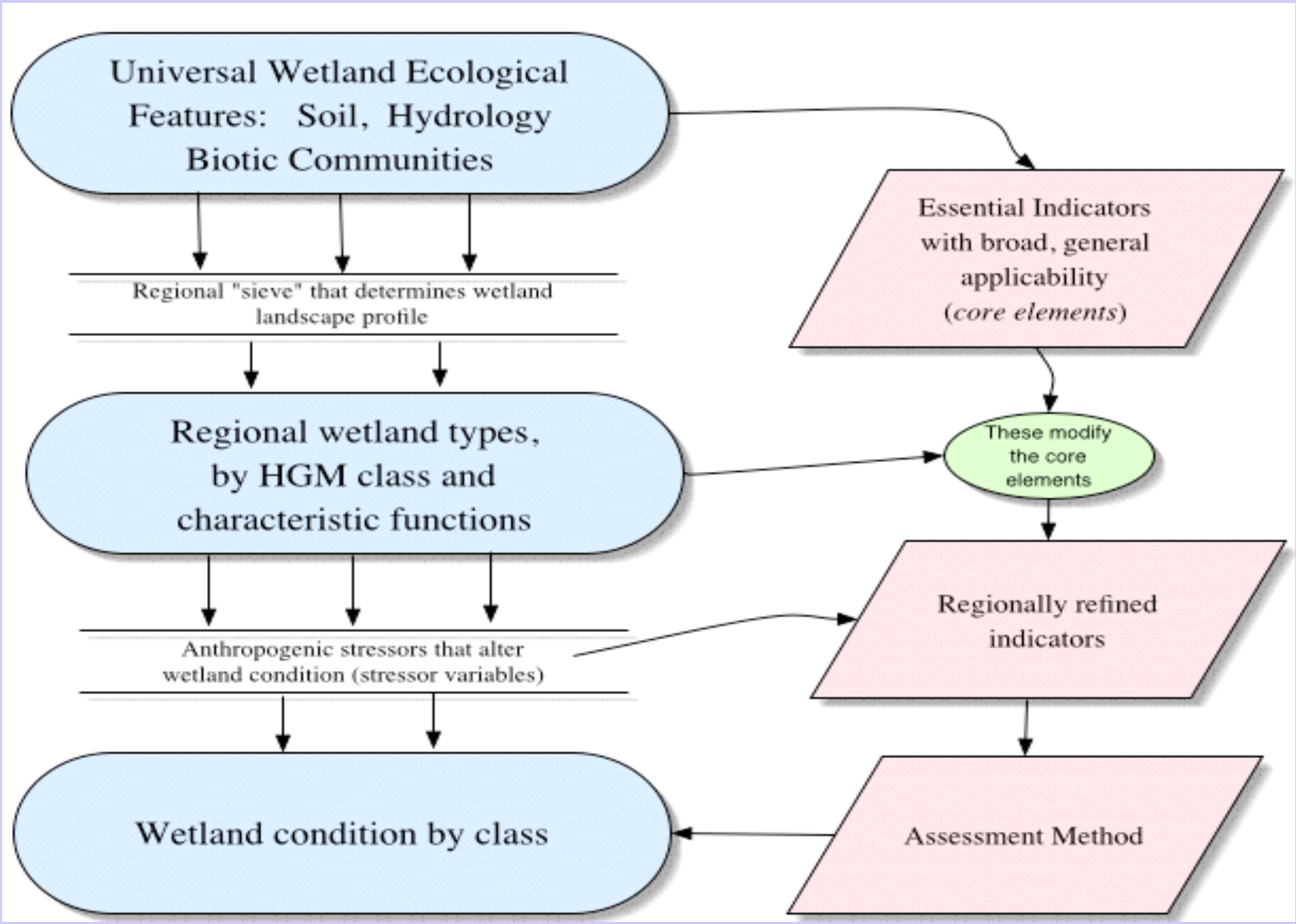
Results of Detailed Review

- Considered 41 methods
- Dropped 25 methods that were not field-based or rapid, or didn't measure condition
- Evaluated 16 methods for ideas on indicators, regionalization, and scoring
- Evaluated 7 methods relative to conceptual model of an assessment method



From Fennessey et al. 2004

Rapid Methods that Assess Condition:

- *Draft California Rapid Assessment Method*
- *Draft Delaware Method*
- *Florida Wetland Rapid Assessment Procedure*
- *Massachusetts CZM Rapid Assessment Method*
- *Montana Wetland Assessment Method*
- *Ohio's Rapid Assessment Method*
- *Penn State's Stressor Check List*
- *Washington's Wetland Rating System*

Results Relative to Conceptual Model

- *Indicators of hydrology and biotic community common; soils not*
- *Wetland type primary regional factor; handled in a variety of ways*
- *Stressors major component; some methods entirely stressor based*

Observations and Conclusions

- *Definition of assessment area is key; varies with method*
- *Each part of the assessment should address a single objective*
- *The process for generating a final score should be transparent and based on the ecology of the system*
- *Calibration and evaluation with quantitative data is essential*

Next Steps:

- *Compare performance of methods in different regions and in different wetland types*
- *Identify broadly applicable indicators*
- *Identify indicators that must be regionalized and develop approaches for regionalization*
- *Determine how to handle special cases and make ties to the stream and other assessments*
- *Develop approaches to evaluate and use methods*

My first reaction:

MAKE IT USER FRIENDLY

Why Wetland Monitoring?

Information is needed to measure the success of wetland programs and integrate wetlands into watershed planning

Why now?

Have the means to do wetland monitoring and assessment cost effectively and well

Literature Cited

Detenbeck, N. E., S. M. Galatowitsch, J. Atkinson, and H. Ball. (1999). "Evaluating perturbations and developing restoration strategies for inland wetlands in the Great Lakes Basin." Wetlands 19(4): 789-820.

Fennessy, M.S., A.D. Jacobs, and M.E. Kentula. 2004. Review of Rapid Methods for Assessing Wetland Condition. EPA600/R-04/009. U.S. Environmental Protection Agency,Washington, D.C.

Download a copy at http://www.epa.gov/nheerl/publications or http://www.epa.gov/owow/wetlands/monitor/

Smith, R., A. Ammann, C. Bartoldus, and M.M. Brinson. (1995). An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices. Technical Report WRP-DE-9. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS, USA.